

PART 1 GENERAL

1.1 DESCRIPTION

- .1 This section specified requirements for supply and installation of structural timber as follows:
 - .1 Supply and installation of treated dimension timber wheelguards, wheelguard blocking, coping and associated painting.
 - .2 Supply and installation of untreated dimension hardwood timber fenders.
 - .3 Supply and installation of hardwood ladders, ladder handgrips and associated hardware and painting.

1.2 RELATED WORK

- .1 Section 03 30 00 – Cast-in-Place Concrete
- .2 Section 06 05 73 – Wood Treatment
- .3 Section 31 53 13 - Timber Cribwork.

1.3 REFERENCES

- .1 Codes and Standards referenced in this section refer to the latest edition thereof.
- .2 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A307 07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
 - .2 ASTM A123/A123M-09, Zinc (Hot-Dip Galvanized) coatings on Iron and Steel Products.
- .3 American Wood Preserver's Association (AWPA)
 - .1 AWPA M4 06, Standard for the Care of Preservation Treated Wood Products.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA B111 Wire Nails, Spikes and Staples.
 - .2 CAN/CSA G40.21 General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.
 - .3 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CAN/CSA O80, Wood Preservation.
- .5 Canadian Wood Council
 - .1 Wood Design Manual.
- .6 National Lumber Grades Authority (NLGA)

- .1 Standard Grading Rules for Canadian Lumber.

1.4 PROTECTION

- .1 Avoid dropping, bruising or breaking of wood fibres.
- .2 Avoid breaking surfaces of treated timber.
- .3 Do not damage surfaces of treated timber by boring holes or driving nails or spikes into them to support temporary material or staging.
- .4 Treat cuts, breaks or abrasions on surfaces of treated timber with three (3) brush coats of preservative to CSA O80.
- .5 Treat bolt holes, cutoffs and field cuts in accordance with CSA O80.

1.5 DELIVERY AND STORAGE

- .1 Store timber horizontally, evenly supported and open piled to permit air circulation when stored for prolonged period.
- .2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excessive bending.
- .3 Handle treated timber with hemp, manila or sisal rope slings or other approved means of support that will not damage surface.
- .4 Do not use sharp pointed tools to handle treated timber. Any timber so handled will be rejected and be replaced at Contractor's expense.

1.6 MEASUREMENT OF PAYMENT

- .1 Treated Dimension Timber:
 - .1 The supply and installation of treated dimension timber for coping, wheelguard and wheelguard blocking will be measured by the cubic metre of timber secured in place, including all fastenings, plant, material, labour and painting of the wheelguard and wheelguard blocking and wheelguard bolt hole levelling sealant.
- .2 Untreated Dimension Hardwood Timber:
 - .1 The supply and installation of untreated dimension timber for hardwood fenders as specified will be measured by the cubic metre of timber secured in place, including all fastenings, plant, material, equipment and labour.
- .3 Ladders (Untreated):
 - .1 The supply and installation of untreated ladders as specified will be measured by the unit secured in place including all fastenings, plant, material, labour,

untreated hardwood ladder uprights, galvanized ladder rungs, galvanized wheelguard hand grips and painting of complete ladders uprights.

- .4 Payment for all dimension timber will be made on volume calculated from nominal sizes as indicated on drawings and specified; e.g. 250 mm x 250 mm.

PART 2 PRODUCTS

2.1 TIMBER MATERIALS

- .1 Timber: use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA.
- .2 Species:
 - .1 Wheelguard, wheelguard blocks, coping, cribwork timbers: Hemlock or Douglas Fir (CCA or ACA Treated).
 - .2 Hardwood fenders and ladder uprights: Birch or Maple (Untreated).
 - .3 Coping: Douglas Fir, Pacific Coast Hemlock or Eastern Hemlock (Treated).
- .3 Grade: No. 1 Structural Grade.
- .4 Grading Authority: National Lumber Grades Authority (NLGA).
- .5 Preservative Treatment: Treat to CSA 080, for coastal waters and Section 06 05 73. Timbers will be treated in the lengths required. Unnecessary field cutting will not be permitted.
- .6 Primer: Alkyd undercoat, exterior oil wood primer.
- .7 Paint: Alkyd/Oil Resin paint in Yellow. Paint to conform to CAN/CGSB-1.61-2004.

2.2 MISCELLANEOUS STEEL AND FASTENINGS

- .1 Miscellaneous Steel: All steel to CSA G40.21, Grade 300W, galvanized.
- .2 Nails and Spikes: to CSA B111, galvanized.
- .3 Machine Bolts and Nuts: to ASTM A307, galvanized.
- .4 Drift bolts: to G40.21 from round stock button head and diamond or wedge point. All drift bolts to be galvanized.
- .5 Washers:
 - .1 Round plate washers: for 16 mm machine bolts will be 76 mm diameter by 6.4 mm thick, for 19 mm machine bolts will be 79 mm diameter by 7.9 mm thick and

- have a hole diameter of 18 and 21 mm respectively. Washers to conform to G40.21. All washers to be galvanized.
- .2 Plain washer: to CSA B19.1, Class 2. All washers to be galvanized.
- .3 Square washers are not permitted.
- .6 Galvanizing:
 - .1 Galvanizing will conform to CSA G164 "Hot Dip Galvanizing of Irregularly Shaped Articles". Unless otherwise specified, minimum weight of zinc coating will be as stated in Table 1 of this standard. Fabricator is to adhere to recommendations of Appendix A and Appendix B of standard.
- .7 Ladder rungs and hand rail: to CSA G40.21, galvanized.
- .8 Lag screws: to CSA B34 and be galvanized. Lag screw washers will conform to CSA B19.1 and shall be galvanized.
- .9 Welding: will be in accordance with the CSA Standards. The welders will be qualified to the appropriate classification as stated in CSA W47.1 "Certification of Companies for Fusion Welding of Steel Structures". The welding will conform to all appropriate requirements and recommendations of CSA Standard W59 "Welded Steel Construction" (Metal Arc Welding).

2.3 ANCHOR BOLT SYSTEM

- .1 Anchor bolt, where required, for anchoring coping and/or wheelguard to existing concrete deck will be 19 mm diameter resin cartridge anchors.
- .2 Submit shop drawings and manufacturer's specification for anchor bolts for approval.
- .3 Anchor bolts to be installed with strict adherence to manufacturer's specifications.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Install structural timbers to details shown on drawings or as specified.

3.2 WHEELGUARD AND WHEELGUARD BLOCKING

- .1 Wheelguard timbers to be 203 mm by 203 mm and will be in minimum lengths of 6100 mm or as specially required with butt joints made over wheelguard blocking sized as shown on the drawings. Wheelguard timbers to be chamfered on top, 25 mm on each horizontal and vertical surface.
- .2 Wheelguard blocks will be installed at 1500 mm on centre as support for wheelguard.

- .3 Wheelguard will be secured through wheelguard blocking, coping and two (2) crib timbers below with two (2) 25 mm diameter drift bolts as shown on detail drawings.
- .4 The installation of wheelguard and wheelguard blocking as per detail

3.3 COPING

- .1 Install 200 mm x 250 mm treated timber coping in minimum lengths of 7620 mm around perimeter of wharf as shown on drawings.
- .2 Secure coping to timber below with 19 mm diameter drift bolts spaced at 1500 mm on centre and to deck support longitudinal with 19 mm diameter machine bolts at 1500 mm on center. The machine bolts will be countersunk on the exterior face; the nut will be installed on the outside and each bolt will be equipped with two (2) washers.

3.4 FENDERS

- .1 Horizontal Fenders
 - .1 Install 100 mm x 150 mm hardwood timber horizontal fenders in minimum lengths of 4880 mm around top perimeter of wharf as indicated on drawings. Stagger joints in coping from joints in horizontal fender. Additional 100 x150 mm hardwood timber horizontal fender to be installed along face of wharf at locations shown on the drawings, leaving 150 mm space.
 - .2 Top horizontal fender to be bevelled 25 mm on top to the seaward face.
 - .3 Secure horizontal fender to coping or cribbing with 16 mm diameter galvanized lag screws, minimum of four (4) lag screws per fender piece, spaced at 1500 mm on centre. All screws to be countersunk on the exterior face.
- .2 Vertical Fenders
 - .1 Install 100 mm x 150 mm hardwood timber fenders spaced at 300 mm on centre along face of the wharf, except for exterior corners where fenders will be closed face for 1500 mm as directed.
 - .2 Secure each fender upright with four (4) 16 mm diameter galvanized lag screws evenly spaced from LNT to underside of horizontal fender. All lag screws to be countersunk.
 - .3 Fenders to extend from underside of horizontal fender to 300 mm below L.N.T.
 - .4 Do not notch or cut fenders to provide straight wharf face. Continuous blocking will be installed behind fenders to provide a straight face.

3.5 LADDERS

- .1 Install ladders on face of wharf in locations shown on drawings or designated by Departmental Representative.
- .2 Ladder uprights to be 150 mm x 200 mm and installed from 1100 mm below LNT to wheelguard elevation. Uprights to be bevelled at 45° on top and painted as specified.

- .3 Details of construction and steel handgrip to be as detailed on drawings.
- .4 Secure each upright with four (4) evenly spaced 19 mm diameter galvanized lag screws. All lag screws to be countersunk.

3.6 PAINTING

- .1 Paint four (4) sides and exposed ends of wheelguard, wheelguard blocks, tops of fenders and complete ladder uprights.
- .2 Use one (1) coat of exterior oil wood primer and two (2) coats of alkyd/oil resin paint as specified. Paint material for each coat to be product of a single manufacturer as specified. Ensure first coat of paint is dry before second coat is applied.

3.7 BOLT SIZING AND HOLING

- .1 Drift bolts: All drift bolts used in the work will have a length equal to thickness of timbers being fastened less 50 mm unless otherwise specified. Holes for drift bolts will be bored 2 mm smaller diameter than size of steel used and for full length of bolts.
- .2 Machine bolts: All machine bolts used in work will have a length equal to thickness of timbers being fastened plus thickness of washers plus 40 mm. Where bolts are countersunk, the length will be as above less depth of countersinking. All machine bolts will be threaded for 64 mm. All holes will be drilled same diameter as bolt.
- .3 Lag screws: All lag screws used in work will have a length equal to thickness of timbers being fastened less 50 mm and the depth of countersinking. Holes for lag screws will be drilled same diameter as shank for shank portion of screw and to inside thread diameter for threaded portion of screw and for full length. All lag screws will be countersunk, screwed, not driven in place and will have one (1) standard washer under the head.
- .4 Countersunk drift bolts and/or lag screws in hardwood fenders and ladders to the extent that the minimum distance from face of timber to head of bolts is 12 mm.
- .5 Bolting of timbers without properly drilled bolt holes will not be accepted.

END OF SECTION